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Find the *Teradyne / LitePoint / ZTEC Instruments ZT530PXI-01* at our website: ***Click HERE***

400 MS/s, 16-Bit Arbitrary Waveform Generator

ZT530 Family for PXI and VXI

- Three-in-one instrument: Arbitrary waveform, function, and digital pattern generator
- 2 (PXI) or 4 (VXI) channels simultaneous
- 16-bit resolution
- 160 MS/s data rate with 2x, 4x and 8x interpolation filter for up to 400 MS/s
- Up to 2 MS record length per channel
- 32 (PXI) or 64 (VXI) TTL pattern outputs
- Powerful triggering, sequencing and segmenting
- Differential waveform synthesis
- PXI multi-module synchronization with optional ZT1000PXI

Calibration Certificate Included

Command Interface
- SCPI (VXI)
- ZTEC Command (PXI)
- Register

Driver Software
- Plug-and-play with example library

Applications
- Mixed signal test
- I/Q modulation
- Video signal generation
- IF testing
- Digital pattern stimulus



ZT532VXI



ZT530PXI

Overview

The ZT530PXI and ZT532VXI are three-in-one modular instruments that provide a high-performance arbitrary waveform generator, a function generator with built-in waveforms, and a digital high speed digital pattern generator. The ZT530PXI is a single wide 3U PXI/CompactPCI instrument. The ZT532VXI is a single-wide C-size VXIbus instrument.

The instrument's excellent analog signal dynamic range and very low noise enable the creation of high-quality video, IF, and high speed digital stimulus. The paired analog signals have minimal channel to channel skew for high quality differential or I/Q signal generation. Extensive segmenting, sequencing, and triggering, along with built-in function generator capabilities, provide a flexible and powerful method to generate a wide variety of waveforms. In addition, digital TTL outputs provide time markers, sync or pattern stimulus.

The instruments come with Plug and Play style drivers that can be used with National Instruments LabVIEW™ and LabWindows™. Instrument control can also be achieved through the command interface or register level access.

High Quality Signal Generation

The combination of high speed and large dynamic range make the instrument a very high-quality signal generator with the added flexibility of an arbitrary waveform generator. Each instrument delivers precise waveforms with 16 bits of vertical resolution, from 10 mVpp to 20 Vpp full scale, and 9 digits of low phase noise frequency resolution. A digital interpolating filter enables DAC output rates of up to 8X the data input (400 MS/s max) to greatly improve harmonic and image rejection.

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DAC Interpolation

The selectable 2X, 4X and 8X interpolation filters enable DAC clock rates up to 400 MS/s to greatly improve the harmonic and image rejection of the reconstruction filters while simultaneously enhancing the passband noise and distortion performance.

Flexible Segmentation and Sequencing

The deep memory on the instrument can be segmented into multiple smaller waveforms that can be pieced together and repeated in a user-defined sequence. Multiple waveforms can be loaded once into the instrument and recalled as needed.

External and Multi-Module Synchronization

Powerful triggering and gating functions allow the instrument to be synchronized to external events and generate waveforms in predefined time intervals. Multiple modules can be easily synchronized using the backplane clock and trigger lines.

Digital Outputs

The pre-DAC digital data signals are also provided as digital TTL outputs. The data is clocked out at the full DAC sample rate up to 160 MS/s to enable 32-bit wide pattern generation.

TTL Synchronization Outputs

Four of the 32 digital TTL outputs can be multiplexed to provide time markers and sync pulses for synchronizing external equipment. These signals provide programmable pulse generator signals that are independent of the DAC data output.

Powerful Triggering and Sequencing

The instrument provides numerous triggering and sequencing modes that enable advanced signal generation capabilities. Waveform generation can be started upon a trigger event or delayed for specified time from the trigger event. The trigger input can be used to gate the output waveform generation sequence. Waveforms can be generated once or looped continuously. Waveform segment sequencing can be synchronized to a trigger event or allowed to advance automatically. Waveform segments can be played back seamlessly in any order, and may be repeated up to 65536 times before advancing to the next segment. Many other combinations of triggering and sequencing allow the user to generate very sophisticated waveforms and waveform sequences.

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Driver Software

Both instruments are delivered with plug-and-play drivers that can be used in most application programming environments, such as LabVIEW, LabWindows/CVI, Visual Basic, and C/C++. An extensive example program library is provided to show various implementations of the driver using both LabVIEW and C.

Instrument control can also be achieved using an intuitive command interface that is based on the SCPI industry standard. The same command interface is used for both the VXI and PXI version of the product, providing additional interchangeability between the two platforms. In addition, register level access is also supported to provide high speed data transfers and flexible integration into non-standard operating environments.

Ordering Information

Standard Configuration

PXI	ZT530PXI-00
VXI	ZT532VXI-00

Options

2 MSample/channel PXI	ZT530PXI-01
2 MSample/channel VXI	ZT532VXI-01

Accessories

SMB to BNC female	ZTSMBBNC-00
SMB to BNC male	ZTSMBBNC-01
Cable kit (PXI)	ZT530KIT-00
Cable kit (VXI)	ZT532KIT-00

Services

Extended warranty (PXI)	ZTEXTPXI-00
Extended warranty (VXI)	ZTEXTVXI-00
Calibration (PXI)	ZTCALPXI-00
Calibration (VXI)	ZTCALVXI-00

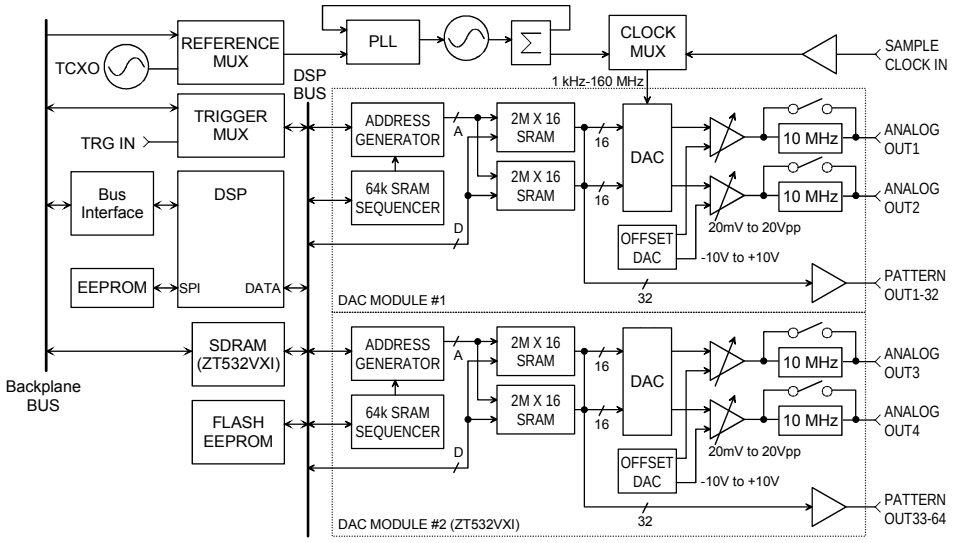


Figure 1: *Instrument block diagram*

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400 MS/s, 16-Bit Arbitrary Waveform Generator

Performance Characteristics

Analog Outputs

Channels	2 (PXI), 4 (VXI)
Passband Flatness	+/- 0.25 dB to 70 MHz for direct path
Lowpass Filter	Software selectable direct path or 10 MHz, 5-pole Gaussian
Slew Rate	> 500 V/µs (Bypass)
Rise/Fall Time	< 20 ns for 10 Vstep into 50Ω (Bypass) < 4 ns for 2 Vstep into 50Ω (Bypass)
Maximum Range	20 mV_{PP} – 20 V_{PP} into high impedance 10 mV_{PP} – 10 V_{PP} into 50Ω
Range Adjust	1000 Ranges, 20 mV to 20 V in 20 mV increments
Range Accuracy	≤ 19V_{PP} into high impedance: ±0.5% + 10 mV > 19V_{PP} into high impedance: ±2%
Range Drift	±50 ppm of Full-Scale per °C
DC Offset Range	0 to ±5V into 50Ω 0 to ±10V into high impedance
Offset Accuracy	|offset| ≤ 9.5 V_{PP} into high impedance: ±10 mV |offset| > 9.5 V_{PP} into high impedance: ±2.5%
Output Limit	|Vampl+Vofs| ≤ 5V into 50Ω |Vampl+Vofs| ≤ 10V into high impedance
Output Impedance	50Ω ±1%
Connectors	SMB (PXI), BNC (VXI)

Digital-to-Analog Converter (DAC)

Resolution	16 Bits (0.0015% of Full-Scale)
Record Length	512 kSamples/channel 2 MSamples/channel (Option 1)
Channel Skew	< 200 ps difference between channels pairs (1-2 in PXI and 1-2 or 3-4 in VXI) at full bandwidth <400 ps difference between all channels (1-2-3-4 in VXI) at full bandwidth

Internal DAC Clock

Function	Internal DAC Clock generated by Phase Locked Loop (PLL)
Synchronization	Channels synchronized at same clock rates
Data Clock Rates	1 kSamples/s to 160 MSamples/s
DAC Clock Rate	1 kSamples/s to 400 MSamples/s
DAC Clock Interpolator	1X, 2X, 4X, or 8X
Clock Resolution	1 kS/s to 10 MS/s: 1, 2.5, 5 steps 10 MS/s to 50 MS/s: 5 MS/s steps 50 MS/s to 100 MS/s: 10 MS/s steps 100 MS/s to 160 MS/s: 20 MS/s steps Other clock rates programmable, contact factory for details
Clock Reference	Internal TCXO, PXIbus Backplane
Internal TCXO	±2.5ppm accuracy

Spectral Purity

	Harmonic	Non Harmonic
+10 dBm Output	-35 dBc	-50 dBc
+20 dBm Output	-30 dBc	-45 dBc

External DAC Clock

Function	External DAC Clock bypasses PLL
Synchronization	Both channels synchronized to external clock
Data Clock Rates	1 MSamples/s to 160 MSamples/s
DAC Clock Rates	1 MSamples/s to 160 MSamples/s
DAC Clock Interpolator	Disabled
Maximum Input	±5 V, no damage
Input Signal Level	500 mVpp to 1 Vpp, sine or square wave
Input Impedance	AC coupled, 50Ω ± 2%
Connector	SMB (PXI), BNC (VXI)

Digital Outputs

Channels	32 (PXI), 64 (VXI) (share connector pins with Sync Outputs)
Time Resolution	6.25 ns to 1 ms (160 MHz to 1 kHz)
Functions	Programmable Pattern Generator
Signal Range	TTL Compatible
Output Loading	±24 mA Drive Capability
Connector(s)	1 (PXI), 2 (VXI) High-Density 50-Pin

Sync Outputs

Channels	4 (PXI), 8 (VXI) (share connector pins with Digital Output bits)
Time Resolution	6.25 ns to 1 ms (160 MHz to 1 kHz)
Functions	Automatic Waveform Markers or Sync Pulses
Polarity	Programmable high or low pulses
Timing	Programmable location and width (in Data Clock samples)
Repetition	Each segment marker can be programmed independently
Signal Range	TTL Compatible
Output Loading	±24 mA Drive Capability
Connector(s)	1 (PXI), 2 (PXI) High-Density 50-Pin

Trigger

Trigger Source	External, Backplane, Software
Trigger Edge	Rising or Falling
Trigger Output	Backplane
Trigger Latency	< (14 DAC Clock Periods + 30 ns)
Trigger Detection Jitter	±½ DAC Clock Period
Trigger Delay	Programmable delay after trigger event before start of waveform
Minimum Delay	0 + Trigger Latency
Maximum Delay	655 seconds +Trigger Latency
Trigger Time Stamp	100 ns resolution, 1 second period

Waveform Sequencing

Sequencing Modes	Normal: output when initiated Triggered: output upon trigger event Qualified Triggered: output upon trigger event when armed Gated: output when arm active
Waveform Size	8 Samples to 512 kSamples 8 Samples to 2 MSamples (Option 1)
Segmentation	1 to 65536 Segments (2M Samples to 8 Samples)
Segment Size	512 kSamples to 8 Samples 2 MSamples to 8 Samples (Option 1)
Sequencing	Continuous Waveform Switching (per Sequence Table)
Sequence Table	Sequence of 1 to 65535 Segment Numbers (with looping)
Segment Repeat	A segment is repeated up to 65536 times before advancing to the next segment in the sequence.
Segment Advance	End of Segment or immediately after Trigger/Gate Event.
Sequence Looping	Infinite, Continuous Sequence

Function Generator Library

DC, Sine, Square, Triangle, Sinc: sin(x)/x. Pulse, Ramp
Noise, Multi-Tone, AM, FM, Digital Patterns, Arbitrary Waveforms

Instrument Setup Storage

Reset	Non-volatile storage of default instrument setup configuration
Save & Recall	Non-volatile storage of 31 instrument setup configurations
Analog settings:	bandwidth, range, offset, output enable, load impedance, and idle voltage
Record settings:	clock rate, clock source, interpolation, waveform size
Sequence settings:	mode, looping, repeat count
Waveform settings:	non-arbitrary waveform type, differential mode, auto selection
Sync settings:	source, start, stop, polarity, output enable, idle pattern
Trigger settings:	source, level, edge, delay, output enable, hold off
Arm settings:	source, polarity

PXI Interface

Size	Single-Wide 3U CompactPCI/PXI
PCI Interface	33 MHz, 32-bit Address, 16-bit Data
PCI Compatibility	Version 2.2

VXI Interface

Size	Single-Wide C-size VXIbus
VXIbus Interface	A16 SCPI Message-Based, A32 Register-Based Fast Data Access

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